Core Flight Software for Unmanned Aircraft Systems, Phase I

Completed Technology Project (2016 - 2016)

Project Introduction

Use of Unmanned Aircraft Systems (UAS) is increasing worldwide, but multiple technical barriers restrict the greater use of UASs. The safe operation of UASs in the National Airspace (NAS) will require the vehicle to equipped with sophisticated avionics and flight software. The cost of verifying the flight software required for safe operation is a tremendous barrier to the growth of the technology. Windhover Labs intends to port NASAs Core Flight Software (CFS) to a UAS platform, and use new techniques and tools to lower flight software verification costs. This will provide a safe platform for UAS technology expansion. Windhover Labs intends to extend the existing safety critical pedigree of CFS to UASs. We will develop all the UAS platform specific applications and integrate them into a UAS avionics package. Windhover Labs will certify the CFS framework so application developers need only focus on the verification of their applications. With the basic UAS platform certification taken care of, UAS users can focus on their specific needs like precision agriculture, aerial survey, product delivery, etc. CFS is built around a software bus which allows for straightforward addition of this application specific software. Windhover Labs will also create an embedded test agent. This agent will provide an automated test engine that has access to all the application interfaces. This embedded agent provides an interface and execution platform for application developers to write effective verification tests. Innovative ground control software will enable automating the execution of these tests and the collecting of necessary verification evidence. The CFS framework is a perfect fit for powering the future of UASs in the NAS. Windhover Labs believes that providing this safety critical flight software framework and verification tools tailored for that framework lowers the technology barrier so many new UAS applications can be brought to market affordably.

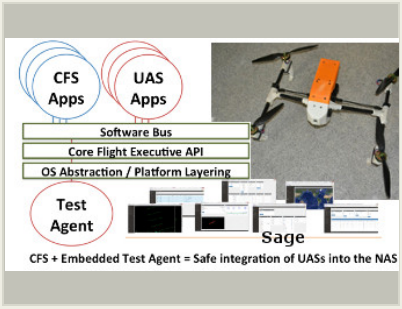

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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	2
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Images	3
Technology Areas	3
Target Destinations	3

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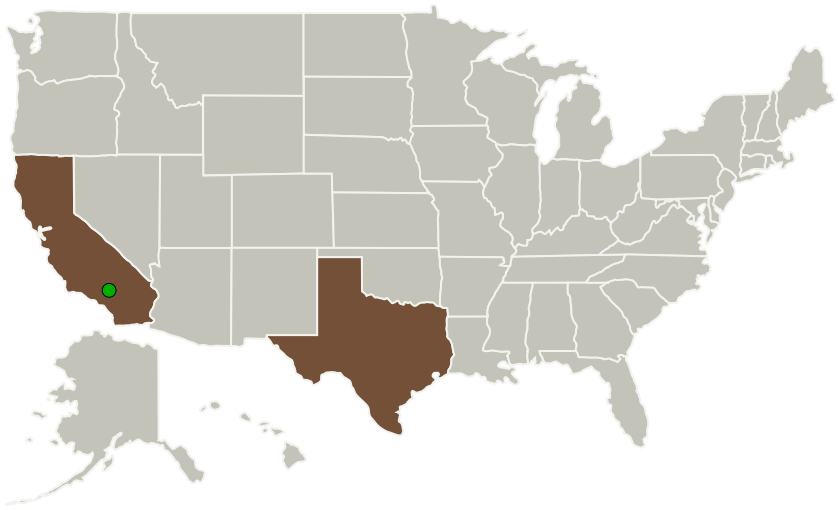
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Windhover Labs	Lead Organization	Industry Veteran-Owned Small Business (VOSB)	League City, Texas
Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

Primary U.S. Work Locations	
California	Texas

Project Transitions

June 2016: Project Start

December 2016: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139827)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Windhover Labs

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

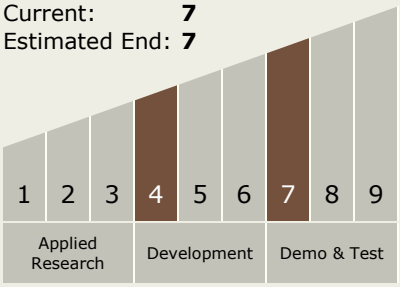
Carlos Torrez

Principal Investigator:

Mathew Benson

Technology Maturity (TRL)

Start: **4**
Current: **7**
Estimated End: **7**



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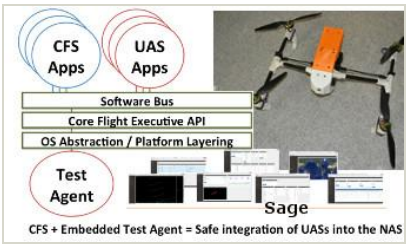
Images



Briefing Chart Image
Core Flight Software for Unmanned Aircraft Systems, Phase I
(https://techport.nasa.gov/image/133241)

Final Summary Chart Image
Core Flight Software for Unmanned Aircraft Systems, Phase I Project Image
(https://techport.nasa.gov/image/126025)

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.1 Software Development, Engineering, and Integrity
    - TX11.1.1 Tools and Methodologies for Software Design and Development

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System